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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CRAVER, CHARLES R

ART UNIT PAPER NUMBER

2682

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9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/810,291

Applicant(s)

ABDELMONEM ET AL.

Examiner

Charles R Craver

Art Unit

2682

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 30-37 is/are allowed.
- 6) ☒ Claim(s) 1-29, 38, 39 and 41-60 is/are rejected.
- 7) ☒ Claim(s) 40 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7, 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7, 9-11, 13-15, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Mimura et al, US Pat 6,480,706.

Claim 1: Mimura discloses a system for a base station which handles reception and transmission communications via an antenna, comprising

A cryostat (8), a receive path disposed in the cryostat (5, 6), a transmit path (via 31 and 32), and wherein the two paths are coupled between the station and the antenna via the system (FIG 4, col 5 line 56-col 6 line 33). **Claim 2:** Mimura discloses a coupler (3, 31) for coupling the paths to the system. **Claim 3:** Mimura discloses that the coupler includes a phase-adjusting portion 3 disposed in the cryostat. **Claim 4:** Mimura discloses a receive filter 5 in the cryostat. **Claim 5:** Mimura discloses that the filter is made of a superconducting material (col 3 lines 18-27). **Claim 6:** Mimura discloses that the transmit path may comprise a filter 31t which is not in the cryostat, which reads a conventional filter. **Claim 7:** Mimura discloses a number of antenna feeds (2, 4, reads

Art Unit: 2682

cables) coupling the receive portions and the transmit portions to the antenna 1 (col 1 lines 12-31). **Claim 9:** Mimura discloses that the coupler includes a phase-adjusting portion 3 disposed in the cryostat. **Claims 10 and 14:** the coupler of Mimura couples the receive and transmit paths between the antenna and the station via the system, and is a duplexer. **Claims 11 and 13:** Mimura discloses that the coupler includes a phase-adjusting portion 3 disposed in the cryostat. **Claim 15:** Mimura discloses a receive filter 5 and a low-noise amplifier 6. **Claims 17 and 18:** the receive filter of Mimura is protected from the transmit path by the duplexer which includes a first stage 31r.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 8, 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mimura et al.

Claims 8 and 12: Mimura discloses applicant's invention of claims 4 and 11, respectively, as shown above; however, Mimura fails to disclose a further phase-adjustment system outside of the cryostat.

However, Mimura discloses as an enhanced embodiment the addition of a second phase-adjusting portion outside of the cryostat (FIG 10, col 7 lines 4-32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

invention to modify the first embodiment of Mimura by such a teaching, as it is disclosed that a second phase-shifter avoids sending high-power signals through the shifter in the cryostat, reducing size.

Claim 16: Mimura discloses applicant's invention of claim 15, as shown above; however, Mimura fails to disclose a further filter connected to the LNA.

However, Mimura discloses as an enhanced embodiment that the LNA may be placed between the receive filter and the receive duplexer filter 31r taught above (FIG 8, col 6 lines 34-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the first embodiment of Mimura by such a teaching, as it is disclosed that such a layout has benefits regarding response and insertion loss.

3. Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mimura as applied to claim 1 above, and further in view of O'Malley et al, US Pat 5,604,925.

Claim 19: while disclosing applicant's invention of claim 1 above, Mimura fails to disclose a cable relaying transmit/receive signals between the system and the station.

O'Malley discloses an analogous art, that is, a cryogenic-cooled receive path for a cellular antenna system (FIG 3), wherein the system may be provided with cables for relaying the transmit and receive signals of FIG 3 (RxB, RxA/TX) to the station as shown in the drawing in FIG 2.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Mimura in such a way, as it would enable the signals to be conveyed between the station and the system, thereby enabling the operation of the entire apparatus. **Claims 20 and 21:** O'Malley discloses that the system is disposed on an antenna tower (FIG 2) where the cables would inherently run the length of the tower.

4. Claims 22-29, 38, 39 and 41-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mimura in view of O'Malley et al.

Claim 22: Mimura discloses a system for a base station which handles reception and transmission communications via an antenna, comprising

A cryostat (8), a receive path disposed in the cryostat (5, 6), a transmit path (via 31 and 32), and wherein the two paths are coupled between the station and the antenna via the system (FIG 4, col 5 line 56-col 6 line 33). Mimura further discloses a coupler (3, 31) for coupling the paths to the system, the coupler includes a phase-adjusting portion 3 disposed in the cryostat, the coupler and phase-adjusting portion thereby disallowing transmit signals from the receive path as it functions as a duplexer.

Mimura fails to disclose that the duplexer connects to the paths using a cable to connect the system to the station.

O'Malley discloses an analogous art, that is, a cryogenic-cooled receive path for a cellular antenna system (FIG 3), wherein the system may be provided with cables for relaying the transmit and receive signals of FIG 3 (RxB, RxA/TX) to the station as shown in the drawing in FIG 2.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Mimura in such a way, as it would enable the signals to be conveyed between the station and the system, thereby enabling the operation of the entire apparatus. **Claim 23:** Mimura discloses a receive bandpass filter 5 in the cryostat. **Claims 24 and 28:** Mimura discloses that the phase-adjusting portion is disposed in the cryostat (FIG 6). **Claims 25 and 26:** the bandpass filtering system of Mimura includes a filter 31r which is a portion of the duplexer (FIG 6), which thus protects the receive filter from transmit signals. **Claim 27:** Mimura discloses as an enhanced embodiment the addition of a second phase-adjusting portion outside of the cryostat (FIG 10, col 7 lines 4-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the first embodiment of Mimura by such a teaching, as it is disclosed that a second phase-shifter avoids sending high-power signals through the shifter in the cryostat, reducing size. **Claim 29:** O'Malley discloses that the system is disposed on an antenna tower (FIG 2) where the cables would inherently run the length of the tower.

Claims 38 and 41: Mimura discloses a system for a base station which handles reception and transmission communications via an antenna, comprising

A cryostat (8), a receive path disposed in the cryostat (5, 6), a transmit path (via 31 and 32), and wherein the two paths are coupled between the station and the antenna via the system (FIG 4, col 5 line 56-col 6 line 33). Mimura further discloses a coupler (3, 31) for coupling the paths to the system, the coupler includes a phase-adjusting portion 3 disposed in the cryostat, the coupler and phase-adjusting portion thereby disallowing

Art Unit: 2682

transmit signals from the receive path as it functions as a duplexer, as well as a number of antenna feeds (2, 4, reads cables) coupling the receive portions and the transmit portions to the antenna 1 (col 1 lines 12-31).

Mimura fails to disclose that the duplexer connects to the paths using a second cable to connect the system to the station.

O'Malley discloses an analogous art, that is, a cryogenic-cooled receive path for a cellular antenna system (FIG 3), wherein the system may be provided with cables for relaying the transmit and receive signals of FIG 3 (RxB, RxA/TX) to the station as shown in the drawing in FIG 2.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Mimura in such a way, as it would enable the signals to be conveyed between the station and the system, thereby enabling the operation of the entire apparatus. **Claim 39:** O'Malley discloses that the system is disposed on an antenna tower (FIG 2) where the cables would inherently run the length of the tower.

Claim 42: Mimura discloses a receive bandpass filter 5 in the cryostat. **Claims 43 and 44:** the bandpass filtering system of Mimura includes a filter 31r which is a portion of the duplexer (FIG 6), which thus protects the receive filter from transmit signals. **Claim 45:** Mimura discloses as an enhanced embodiment the addition of a second phase-adjusting portion outside of the cryostat (FIG 10, col 7 lines 4-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the first embodiment of Mimura by such a teaching, as it is disclosed that a second phase-shifter avoids sending high-power signals through the shifter in the cryostat,

reducing size. **Claim 46:** Mimura discloses that the phase-adjusting portion is disposed in the cryostat (FIG 6).

Claims 47 and 48: Mimura discloses a system for a base station which handles reception and transmission communications via an antenna, comprising

A cryostat (8), a receive path disposed in the cryostat (5, 6), a transmit path (via 31 and 32), and wherein the two paths are coupled between the station and the antenna via the system (FIG 4, col 5 line 56-col 6 line 33). Mimura further discloses a coupler (3, 31) for coupling the paths to the system, the coupler includes a phase-adjusting portion 3 disposed in the cryostat, the coupler and phase-adjusting portion thereby disallowing transmit signals from the receive path as it functions as a duplexer, as well as an antenna feed 4 (reads cables or I/O connection) coupling the receive portions and the transmit portions to the antenna 1 (col 1 lines 12-31).

Mimura fails to disclose that the duplexer connects to the paths using a second cable (a second I/O connection) to connect the system to the station.

O'Malley discloses an analogous art, that is, a cryogenic-cooled receive path for a cellular antenna system (FIG 3), wherein the system may be provided with cables for relaying the transmit and receive signals of FIG 3 (RxB, RxA/TX) to the station as shown in the drawing in FIG 2.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Mimura in such a way, as it would enable the signals to be conveyed between the station and the system, thereby enabling the operation of the entire apparatus. **Claim 49:** Mimura discloses that the phase-adjusting portion is

Art Unit: 2682

disposed in the cryostat (FIG 6). **Claim 50:** Mimura discloses a receive filter 5 in the cryostat. **Claim 51:** Mimura discloses that the filter is made of a superconducting material (col 3 lines 18-27). **Claim 52:** Mimura discloses that the transmit path may comprise a filter 31t which is not in the cryostat, which reads a conventional filter. **Claim 53:** Mimura discloses an antenna feed 4 (reads cable) coupling the receive portions and the transmit portions to the antenna 1 (col 1 lines 12-31). **Claims 54 and 58:** Mimura discloses as an enhanced embodiment the addition of a second phase-adjusting portion outside of the cryostat (FIG 10, col 7 lines 4-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the first embodiment of Mimura by such a teaching, as it is disclosed that a second phase-shifter avoids sending high-power signals through the shifter in the cryostat, reducing size. **Claim 55:** Mimura discloses that the coupler includes a phase-adjusting portion 3 disposed in the cryostat. **Claims 56 and 60:** the coupler of Mimura couples the receive and transmit paths between the antenna and the station via the system, and is a duplexer. **Claims 57 and 59:** Mimura discloses that the coupler includes a phase-adjusting portion 3 disposed in the cryostat.

Allowable Subject Matter

5. Claims 30-37 are allowed.
6. Claim 40 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2682

7. The following is an examiner's statement of reasons for allowance:

Claims 30 and 40 teach towards a front-end system for a cellular antenna, for use between an antenna and a station, including a cryostat and a transmit and receive path, including a coupling means for coupling the paths to and from the antenna including phase-adjusting means to keep transmit signals out of the receive path, and a further coupling means at the other side of the circuit for coupling the paths to the station, including a second phase-adjusting means for keeping transmit signals out of the receive path. The prior art discloses a cryogenically-cooled system between an antenna and station including a coupler with a phase-adjusting means, but fails to teach or suggest a second phase-adjusting means at the other end connecting the paths to the station. Claims 31-37 are allowed based on their dependence on claim 30.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yandrofski and Hershtig discuss cryogenically-cooled cellular base station systems.

Art Unit: 2682

Abdelmonem '028, '331 and '341 are co-pending applications/patents by the instant inventor.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 872-9314 for both formal and informal/draft communications, labeled as such.

Hand delivered responses should be brought to Crystal Park II, 2121

Crystal Drive, Arlington VA, sixth floor (receptionist).

Any inquiry concerning this or earlier communications from the examiner should be directed to examiner Charles Craver at (703) 305-3965.

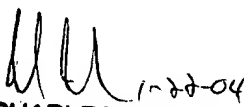
If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Vivian Chin, can be reached at (703) 308-6739.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at (703) 305-4700.

CC

C.Craver

22 January 2004


CHARLES CRAVER
PATENT EXAMINER